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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,865	04/02/2004	Toshikazu Oshidari	023971-0392	9859

22428 7590 10/23/2006

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EXAMINER	
MULLINS, BURTON S	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/815,865	Applicant(s) OSHIDARI ET AL.	
	Examiner Burton S. Mullins	Art Unit 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *3 and 18* is/are allowed.

6)☒ Claim(s) *1,2,4-17,19 and 20* is/are rejected.

7)☒ Claim(s) *21-24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-2, 5-8, 11-12, 14-15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano (US 6,114,784) in view of Muramatsu et al. (JP 11-346446). Nakano teaches a stator for use in a two rotor single stator type electric motor in which inner and outer rotors 10/30 are adapted to rotated independently with respect to each other within and around an axis of the stator 20 upon application of electric power to the stator, the stator comprising: a stator core including a plurality of stator teeth that are independent with respect to each other and circumferentially arranged around a common axis, each stator tooth including a plurality of flat magnetic steel plates 21 that are aligned along the common axis (Figs.2&7) while contacting one another (c.2, lines 36-39). Nakano further teaches two bracket members 44/45 between which the stator core 21 is sandwiched with connecting members (bolts) 43 (Fig.2) to fasten the sandwiched stator core within the two brackets 44/45 (Fig.2, c.3, lines 33-44).

Nakano does not teach "at least one connecting ring plate coaxially installed in the stator core in such a manner that the ring plate is put between adjacent two of the flat magnetic steel plates of each stator tooth while contacting both of the flat magnetic steel plates, the ring plate being of an endless annular member and having a thickness that is smaller than an axial length of the stator."

Muramatsu teaches a stator core assembly comprising a plurality of stator teeth laminations 80 connected by endless annular members forming connecting ring plates 81 (Fig.1,

abstract) which are put between adjacent two flat stator teeth laminations 80 so as to contact on either side a flat stator lamination 80 (Figs.1-2). The ring plates eliminate leakage flux (abstract).

It would have been obvious to modify Nakano and provide at least one connecting ring plate per Muramatsu since this would have eliminated leakage flux.

Regarding claim 2, as seen in Muramatsu Fig.3, the ring plate 81 comprises an annular inner portion and a plurality of finger portions extending radially outward therefrom.

Regarding claim 5, Muramatsu's plates 81 are nonmagnetic (abstract).

Regarding claims 6-8, Muramatsu's teeth each comprise a generally rectangular cross section (Fig.2) and have a taper (Fig.9) and an auxiliary member G between the teeth (Fig.4).

Regarding claim 11, the connecting ring plates 81 formed by Muramatsu would inherently comprise a means "adapted to suppress deformation or inclination of the stator teeth, when a torque is applied to the stator" due to the endless annular structure of Muramatu's ring plates 81 (Fig.3), and further because each connecting ring plate 81 contacts flat magnetic steel plates 80 on either side and because the ring plates 81 include bridging portions 810 which suppress deformation and inclination of the entire stator structure.

Regarding claims 12 and 14, Muramatsu teaches at least two connecting ring plates 81, wherein at least some of the flat magnetic steel plates 80 are held between the two connecting ring plates. In combination with Nakano's bolts and brackets, Muramatsu's ring plates hold the laminations only by compression forces acting through the ring plates.

Regarding claim 15, Nakano teaches plural stator teeth 21a independent with respect to one another (Fig.7). In Muramatsu, at least one connecting ring plate 81 coaxially installed in

the stator core is installed in such a manner that the ring plate 81 is put between adjacent two of the flat magnetic steel plates 80 of each stator tooth while contacting both of the flat magnetic steel plates 80 (Figs.1&2).

Regarding claim 17, in Nakano, the stator does not include a yoke between the stator core 21 and the outer rotor (not shown, Fig.7).

3. Claims 1, 4, 8-9, 11, 15 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano (US 6,114,784) in view of Itoh et al. (US 6,225,725). As described above, Nakano substantially teaches applicant's invention but does not teach "at least one connecting ring plate coaxially installed in the stator core in such a manner that the ring plate is put between adjacent two of the flat magnetic steel plates of each stator tooth while contacting both of the flat magnetic steel plates, the ring plate being of an endless annular member and having a thickness that is smaller than an axial length of the stator."

Itoh teaches a stator core construction (second embodiment, Figs. 10-11, c.4, lines 28-58) comprising plural flat pole piece laminations 34 with connecting ring plates comprising iron core blanks 50 of magnetic steel (c.6, lines 20-25) in intimate contact with and between two of the flat laminations 34 (Figs.10-11) and having a thickness that is smaller than an axial length of the stator (Fig.11). In the second embodiment, the bridges 55 of the iron core blanks/connecting ring plates 50 are not cut and thus the ring plates remain intact and form endless annular members (c.4, lines 31-33). The iron core blanks/connecting ring plates 50 provide improved manufacturing (c.5, lines 5-13) and increased structural stability of the stator (c.4, line 66-c.5, line 4).

It would have been obvious to modify Nakano and provide connecting ring plates per Itoh to improve manufacture and structural stability of the stator.

Regarding claims 8-9, note Itoh's teeth 34 with auxiliary stator member at the radially leading end thereof (Fig.8b) and non-magnetic, connecting metal (brass) member 38 between adjacent teeth for reducing displacement (c.6, lines 10-18).

Regarding claim 11, Itoh's iron core blanks/connecting ring plates 50 inherently comprise means "adapted to suppress deformation or inclination of the stator teeth, when a torque is applied to the stator" due to the endless annular structure of Itoh's ring plates 50 (Fig.2), and further because each connecting ring plate 50 contacts flat magnetic steel plates 34 on either side (Fig.11) and because the ring plates 50 include (uncut) bridging portions 55 which suppress deformation and inclination of the entire stator structure.

Regarding claim 15, Nakano teaches plural stator teeth 21a independent with respect to one another (Fig.7). In Itoh, the at least one connecting ring plate 50 (Fig.11) is coaxially installed in the stator core in such a manner that the ring plate 50 is put between adjacent two of the flat magnetic steel plates 34 of each stator tooth while contacting both of the flat magnetic steel plates 34 (Fig.11).

Regarding claim 20, in Nakano, the stator does not include a yoke between the stator core 21 and the outer rotor (not shown, Fig.7).

4. Claims 10, 13, 16 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakano (US 6,114,784) in view of Muramatsu et al. (JP 11-346446) and Kurosawa et al. (US 6,043,583). Nakano teaches a stator for use in a two rotor single stator type electric motor in which inner and outer rotors 10/30 are rotated independently with respect to each other within

and around the stator 20 upon application of current to the stator, the stator comprising: a stator core including a plurality of stator teeth that are independent with respect to each other and circumferentially arranged around a common axis, each stator tooth including a plurality of flat magnetic steel plates 21 that are aligned along the common axis (Figs.2&7) while contacting one another (c.2, lines 36-39). Nakano further teaches plural coils 15 around the stator teeth and two supporting brackets 44/45 between which the stator teeth are sandwiched with fastening members (bolts) 43 (Fig.2) that fasten the two supporting brackets 44/45 to tightly connect the magnetic steel plates 21 of each stator tooth to one another, thereby fastening the sandwiched stator core within the two brackets 44/45 (Fig.2, c.3, lines 33-44).

Nakano does not teach: 1) "at least one connecting ring plate coaxially installed in the stator core in such a manner that the ring plate is put between adjacent two of the flat magnetic steel plates of each stator tooth, the ring plate being of an endless annular member and having a thickness that is smaller than an axial length of the stator"; or 2) "a molded plastic that embeds therein the stator, the connecting ring plate, the coils, the two supporting brackets and the fastening members thereby to constitute a cylindrical structure".

Regarding (1), Muramatsu teaches a stator core assembly comprising a plurality of stator teeth laminations 80 connected by endless annular members forming connecting ring plates 81 (Fig.1, abstract) which are put between adjacent two flat stator teeth laminations 80 so as to contact on either side a flat stator lamination 80 (Figs.1-2). Each connecting ring plate 81 comprises an endless annular member (Fig.3) and has a thickness that is smaller than an axial length of the stator, as seen in Fig.1. The connecting ring plates eliminate leakage flux (abstract).

Regarding (2), Kurosawa teaches a laminate stator core comprising stacked sheet members 1 and a molding comprising a synthetic resin layer which surrounds the stator core structure (Figs.1&2). The resin mold keeps the lamination sheets in contact with each other and maintains their accuracy and durability (c.2, lines 20-26).

It would have been obvious to modify Nakano and provide at least one connecting ring plate per Muramatsu since this would have eliminated leakage flux; and further more to mold plastic and embed the stator/ringplate/coil/bracket/fastener structure of Nakano/Muramatsu per Kurosawa since molding would have been desirable to keep the lamination sheets in contact and improve accuracy and durability.

Regarding claim 13, Muramatsu teaches at least two connecting ring plates 81, wherein at least some of the flat magnetic steel plates 80 are held between the two connecting ring plates. In combination with Nakano's bolts and brackets, Muramatsu's ring plates hold the laminations only by compression forces acting through the ring plates.

Regarding claim 16, Nakano teaches plural stator teeth 21a independent with respect to one another (Fig.7). In Muramatsu, at least one connecting ring plate 81 coaxially installed in the stator core is installed in such a manner that the ring plate 81 is put between adjacent two of the flat magnetic steel plates 80 of each stator tooth while contacting both of the flat magnetic steel plates 80 (Figs.1&2).

Regarding claim 19, in Nakano, the stator does not include a yoke between the stator core 21 and the outer rotor (not shown, Fig.7).

Allowable Subject Matter

5. Claims 3 and 18 are allowed. Applicant incorporated the indicated allowable subject matter of at least one connecting ring plate comprising an annular outer base portion and a plurality of finger portions that radially extend inward from the annular outer base portion, as shown in Fig.8.

6. Claims 21-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art does not teach the claimed stator including, inter alia, "a planetary gear unit including a first sun gear and a second sun gear..., wherein the inner rotor is rotationally linked to the first sun gear, and the outer rotor is rotationally linked to the second sun gear."

Response to Arguments

7. Applicant's arguments filed 22 February 2006 have been fully considered but they are not persuasive.

Applicant argues that it would not have been obvious to modify Nakano per Muramatsu because use of Muramatsu's yokes would have interfered with the cooling structure in Nakano. This is not persuasive since Muramatsu is used as a teaching for connecting ring plates 81 between two flat stator teeth laminations 80 for the purpose of eliminate leakage flux (abstract). Nakano's stator cooling jackets 80 are formed between the bolt holes 81 of his core steel plates 21 and outer peripheries of bolt shaft portions 43a of bolts 43 (c.5, lines 20-23). Use of Muramatsu's connecting ring plates on either side of Nakano's core steel plates would not

interfere with Nakano's cooling arrangement because the bolt holes would pass through the ring plates. Further, there is nothing in Nakano that teaches away from the use of yokes. Nakano's segmented stator (Fig.7) comprises plural core steel plates 21 divided in the radial direction and connected via resin molding 83 (c.5, lines 30-43). There is no teaching that his divided core structure contributes to or limits cooling, nor has applicant demonstrated how and why this could be the case, exactly. Further, use of an integrated yoke such as Muramatsu would appear to improve cooling since more surface area of the stator ring plates or laminations would be in contact with the cooling jackets, thus improving heat transfer. The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that there is no suggestion to combine the references because the ordinary artisan would not have sought the teachings in Muramatsu to eliminate leakage flux, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Muramatsu's ring plates 81which are put between adjacent two flat stator teeth laminations 80 so as to contact on either side a flat stator lamination 80 (Figs.1-2) eliminate

leakage flux (abstract). There is no requirement for an obviousness rejection that a specific problem be eliminated completely. Further, applicant mischaracterizes Muramatsu. The "huge gaps" of the "male sprocket shape" in Figs.5&7 are not located at the ends of the stator poles facing the rotor (Muramatsu discloses an outer stator/inner rotor arrangement). The ends of the poles facing the rotor are actually connected by bridges 8C. These would contribute to elimination of leakage in a manner similar to that of Nakano's inner-stator structure, where the spaces between the pole ends are small.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach

the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
09 October 2006